

interocular space, midway between the posterior nostril and the upper extremity of the gill-cleft; posterior nostril midway between the end of the snout and the eye. Five rows of teeth in the præmaxillary, nearly all bicuspid, the outer row comprising about twenty teeth; mandibular teeth scarcely larger than præmaxillaries, bicuspid. Labial lobes large and covered with granular papillæ; the cleft of the mouth measures three fifths the width of the buccal disk; barbels measuring half the length of the head. Adipose fin quite indistinct. The origin of the first dorsal is nearly twice as far from the caudal as from the end of the snout; its first ray is scarcely prolonged, measuring a little less than the distance between the posterior nostril and the posterior extremity of the head. First pectoral ray little prolonged, a little shorter than the head, measuring about one third of the distance between its base and the anal, and not extending to the middle of the outer ventral ray. Ventral fins originating slightly in advance of the dorsal; the outer ray much thickened and a little prolonged, measuring half the distance between its base and the anal. Anal opening equally distant from the extremity of the ventrals and the origin of the anal. First anal ray two thirds the length of the ventral, halfway between the extremity of the ventral and the caudal. Caudal fin crescentically notched, with the outer rays a little produced and a little shorter than the head. Olive-brown above, closely spotted with darker.

Total length 89 millim., without caudal 75; length of head 16; width of head 16; depth of body (above base of ventrals) 12.

Specimens were obtained in the Andes of Ecuador (Milligalli) by Mr. Edward Whymper.

## 5. On some new Species of Fishes from Madeira.

By JAMES YATE JOHNSON, C.M.Z.S.

[Received June 3, 1890.]

Family SERRANIDÆ.

### 1. ANTHIAS MUNDULUS, sp. n.

B. 6. D. 10/16. V. 1/5. A. 3/7. Lat. line 37.

Oblong compressed; the height being to the length without the caudal as 1 to  $3\frac{3}{7}$ . Body, head, and checks scaly. Scales of moderate size, the exposed edge finely pectinate.

*Head* compared with length without the caudal as 1 to 3. *Eyes* round, large, scarcely more than half a diameter from the snout and less than a diameter apart; they do not take part in the profile. Diameter of eye to length of head as 1 to 3. Snout short, obtuse, upper jaw protrusile; rictus very oblique, not reaching to orbit. Upper border of *mouth* formed entirely of the premaxillary; maxillary much dilated posteriorly, its scales not larger than those

of the head, its posterior extremity not reaching quite so far as the vertical from the middle of the eye.

In the upper jaw there is a narrow band of minute curved teeth with two larger conical teeth; at the front of the lower jaw a similar band of teeth with four conical ones, and at the sides behind a single series of teeth. Minute teeth on the vomer and palatines; none on the tongue. The opercular pieces are clothed with scales. There is a spine near the upper angle of the opercle and another spine a little lower down. Lower still are a few serratures. The vertical border of the preopercle is strongly serrate, and there is a spine at the angle with a smaller spine a little beyond. The rest of the lower edge is entire. All the spines are directed backwards.

The *dorsal* fin begins over the root of the pectorals and extends a little beyond the end of the anal. The first and second spines are short, the third and fourth are equal in length and have skinny tags at their tops. The soft portion of the fin is higher than the spinous portion; the last rays reach to the base of the caudal. The *pectorals* are not quite so long as the ventrals, and they reach back to the beginning of the anal, or to the end of the spinous portion of the dorsal; their bases are scaly. The *ventrals* are inserted under the root of the pectorals and reach back a little beyond the commencement of the anal. The second soft ray is elongate and filiform. The *anal* begins a little behind the middle of the base of the dorsal. The first spine is short, the second stout and the longest of the three. The soft portion of the fin is higher than the second spine, but the last rays do not reach nearly so far as the base of the caudal. The *caudal* is deeply furcate and has some of the exterior rays elongate and filiform. The membrane between the rays is scaly as in *Callanthias*.

The *lateral line* has 37 scales; it rises from the edge of the gill-cover, runs high up on the side following the curve of the back, descends rapidly under the end of the base of the dorsal, and passes along the middle of the tail to the base of the caudal.

The colour of all the specimens had faded to a pale brown; but faint traces of pink or red were visible in parts, and there seemed to have been twelve or more narrow transverse bands on the sides, alternating with paler bands.

This fish much confuses the distinction between the genera *Anthias* and *Callanthias*. With the only known member of the latter genus it agrees in having only six branchiostegal rays, in possessing much the same external form, and in having the angles of the caudal fin prolonged into filaments. It would therefore appear that the difference between the two genera is reduced to the serrature of the border of the preopercle, which is present in *Anthias* and not in *Callanthias*, a trifling artificial distinction.

The first specimen that came under my notice was found dead and dry by myself, in a cavity amongst a mass of *Ostrea* and *Chama* shells brought up from deep water. Afterwards four specimens were taken by the officers of the 'Britannia' whilst engaged in repairing

the Brazilian Submarine Company's cable in Funchal bay, two of which are now in the British Museum.

	millim.
Length of fish without caudal .....	48
Height at the shoulder .....	14
Head, length 16; thickness nearly .....	8
Eye, diameter.....	5.5
Dorsal fin, length of base .....	26
Pectorals, length 14; distance of root from snout	17
Ventrals, length .....	15
Anal, length of base .....	11
Caudal, length .....	19

### Family SCOPELIDÆ.

#### 2. SCOPELUS LANGERHANSI, sp. n.

1st D. 12. 2nd D. rudimentary. P. ca. 14. V. 8. A. ca. 24.  
B. M. 5?

Compressed, elongate; height to length without caudal fin 1 to  $5\frac{1}{4}$ .

*Colour* blackish, with numerous small silvery spots: two longitudinal rows of about 8 each on the belly; a row more widely separated halfway between the median line of the belly and the lateral line; a few just below the lateral line and a close row of about 20 at each side of the anal fin up to the base of the caudal.

*Head* large; compared with length of fish without caudal as 1 to  $3\frac{2}{5}$ . Profile quadratic; snout very short, about half the diameter of the *eye*, which is round and large, being nearly 11 mm. in diameter or about one third the length of the head. It is surrounded by a thin bony crest, which is more prominent above. The space between the eyes is concave, and at the fore part of it there is a thin bony crest along the snout. The inside of the mouth and gill-covers is black. The rictus reaches to about the vertical of the posterior part of the orbit. The upper border of the mouth is formed entirely of the premaxillaries. Both premaxillary and maxillary are dilated posteriorly.

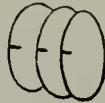
Minute *teeth* in narrow brush-like bands are found in both jaws and on the palatines; the innermost teeth are rather larger. There are also teeth on the vomer, and the entopterygoids are roughened with asperities.

The *tongue* is of peculiar form, being boat-shaped, hollowed at the middle, with a small tip. The gill-covers are scaly; the fore edge of the preopercle is turned up so as to form a thin vertical crest, which is continued nearly up to the angle of the mouth. The inner edges of the mandibular pieces are also turned up into crests.

The first *dorsal* fin commences over the root of the pectorals and much in advance of the root of the ventrals; its base is only 16 mm. long; it does not extend quite so far as the end of the anal. As

the fin was mutilated, further account of it cannot be given. The rudimentary second dorsal is placed a little in advance of the posterior end of the base of the anal, and about 16 mm. from the base of the caudal. The long narrow *pectorals* are inserted near the edge of the opercle and extend back much beyond the base of the ventrals, reaching almost as far as their tips, but not quite so far as the vertical from the posterior end of the base of the dorsal. Compared with the length of the fish without the caudal, they are as 1 to  $4\frac{2}{5}$ . The abdominal *ventrals* were mutilated in the specimen; but the more perfect one was 15 mm. in length; they are inserted about 13 mm. behind the root of the pectorals. The *anal* begins a little behind the posterior end of the base of the first dorsal; its base has a length of 25 mm. What remained of the furcate caudal had a length of 19 mm. There were no spines on any part of the fish.

The scales had been nearly all removed; the few remaining were cycloid and thin. The *lateral line* commences at the upper angle of the opercle and falls rapidly on the side of the body until it reaches



*Scopelus langerhansi.*

Scales of lateral line, enlarged.

the middle of the base of the first dorsal, thence it runs along the middle of the height to the base of the caudal. On one side of the body, in the neighbourhood of the rudimentary dorsal, three scales of the lateral line were left to show that these scales were very large, transversely elliptical and imbricated. They were 6 mm. wide, or about half as wide as the tail at that part.

The single specimen of this fish that has occurred was obtained from a fisherman by my friend the late Prof. Dr. Langerhans, and was sent by him to the Museum of Natural History at Berlin under the name of *Alysia loricata*, Lowe. But from that fish (which Dr. Günther believes to be *Scopelus coccoi*) the fish here described differs in many important respects. On comparing the above description with Mr. Lowe's description of *Alysia*, the following differences (along with others) will be found to exist:—1. In this fish the pectoral fins extend much beyond the roots of the ventrals; in *Alysia* the ventral fins are inserted under the tips of the pectorals. 2. The ventrals have 8 rays; in *Alysia* 6. 3. The first dorsal fin begins over the root of the pectorals; in *Alysia* that fin is placed over the space between the ventrals and the anal. 4. The caudal fin is very small in *Alysia*, whilst here it is longer than the height of the fish. 5. In *Alysia* there are spines on the tail both above and below; here there are no spines. 6. In *Alysia* there is a single

row of silvery spots along the ventral line; here there are several rows of silvery spots on the sides.

	millim.
Length without caudal . . . . .	110
Height at root of pectorals . . . .	20
Thickness at root of pectorals . .	12
Head, length . . . . .	31
Premaxillary, length . . . . .	17
Pectoral fin, length . . . . .	25

### 3. SCOPELUS SCHMITZI, sp. n.

B. M. 6. 1st D. 12. 2nd D. rudimentary. V. 7. A. 14.

Oblong, compressed; height to length without caudal as 1 to  $4\frac{2}{5}$ . Blackish, reflecting steel-blue from the sides and gill-covers; a row of small spots behind the vent near the ventral line on each side, a few before the vent, and a few irregularly scattered at the sides of the body. Scales cycloid, finely and concentrically striate.

*Head* to length of fish without caudal as 1 to  $3\frac{2}{5}$ . Snout very short. Head and cheeks scaly. *Eye* round, not quite reaching to the profile, less than half a diameter from the snout and coming nearly up to the maxilla. Diameter of eye to length of head as 1 to  $3\frac{1}{2}$ . A low median crest between the eyes and along the snout. Posterior margin of opercle projects with a deltoid angle over the root of the pectorals. Inside of *mouth* and gill-covers black. Rictus oblique, nearly 11 mm. long, reaching much beyond the orbit and nearly to below the lower angle of the opercle. Upper border of mouth formed entirely of the premaxillary, which is dentiferous up to its end.

*Teeth* minute, curved, sharp, in narrow brush-like bands in both jaws. In the lower jaw the band of teeth is broader than that in the upper jaw, and it is seen outside when the mouth is closed. There are teeth on the palatines and a few minute ones on the vomer; the entopterygoids are rough with points. Minute teeth along middle of tongue expanding posteriorly into a broad patch. The gill-rakers are also armed.

The first *dorsal* fin is short: it begins over the root of the ventrals or slightly in advance; the base ends a little before the beginning of the anal: its posterior rays reach back a little beyond the tips of the ventrals and as far as the commencement of the anal. The second rudimentary dorsal is very small; it is placed over the end of the base of the anal. The narrow pointed *pectorals* are inserted low down and reach back to or a little beyond the base of the ventrals. The *ventrals* reach back as far as the vent. At the upper angle of the root there is a narrow scale-like loose appendage. The *anal* fin has 14 rays; and it begins a little behind the end of the base of the dorsal. The *caudal* fin is furcate and has about 20 rays.

The *lateral line* is straight along the middle of the body and tail. There are about 38 scales in its length, and about 5 above and 5 below the lateral line.

Two specimens of this little fish were found lying on the sandy beach near what is known as the "Fossil Bed" at the east end of Madcira by the Rev. Padre Ernesto Schmitz, Director of the Seminario, Funchal, and one of the specimens is now in the British Museum. The following are the dimensions:—

	millim.
Length without caudal . . . . .	51
Height, pectoral region . . . . .	11
Head, length 14; thickness . . . . .	6
Pectorals, length 7; distance of base from snout	15
First dorsal, height 7; length of base . . . . .	7
First dorsal, distance from snout . . . . .	21
Second dorsal, distance from first . . . . .	10
Ventrals, length 9; distance of root from root of pectorals . . . . .	5
Anal, height 6; length of base . . . . .	8
Anal, distance from snout . . . . .	30
Caudal, length 13; lowest height of tail . . . . .	5

#### 4. SCOPELUS PUSILLUS, sp. n.

D. 9. V. 5 or 6. A. ca. 7. M. B. 6.

Small, compressed, moderately elongate; the height compared with the length (without the caudal fin) being as 1 to  $5\frac{1}{4}$ . Black; scales cycloid, about 32 in the side and 7 or 8 in the height. There is no trace of silver spots on the head or body.

*Head* scaleless, not cubic or striate, top rounded; snout very short, profile not steep. Compared with the length of the fish (without the caudal) the head is as 1 to  $4\frac{1}{4}$ . *Eye* oval, of moderate size, not reaching the profile, compared with length of head as 1 to  $3\frac{1}{5}$ . It is placed near the upper jaw and about half a diameter from the tip of the snout. *Rictus* very long, extending much beyond the eyes and being nearly equal to seven eighths of the length of the head. The upper border of the *mouth* is formed by the premaxillaries, which are only slightly dilated posteriorly. The styliform maxillaries lie behind. The inside of the mouth is black, and it is copiously furnished with teeth. In the lower jaw there is a band of minute glassy teeth in about four rows. In the front of the upper jaw there is a single row of similar teeth with a band of 2-3 rows on each side behind. The palatines carry a narrow band of minute teeth, and on each entopterygoid is a long broad band of teeth. On the pharyngeals are broad patches of teeth, and on the vomer about 6 teeth. A narrow band of very minute teeth runs along the middle of the tongue, expanding into an oval patch behind, where the teeth are longer and subulate. At each side of the tongue there are short transverse series of minute teeth with a longer subulate one in each series. Lastly, the gill-rakers are rough with teeth.

The short *dorsal* is placed near the middle of the back over the space between the ventrals and the anal. It is higher anteriorly than behind, and there are about nine rays. There is no second

adipose dorsal. The *pectorals* are placed low down, are narrow and pointed; they are much damaged in the specimen, but they are not rudimentary (as in *Nannobrachium*), as they reach back to the root of the ventrals. The *ventrals* have five or six rays and reach back to the vent, but not so far as the anal; they are inserted nearly under the commencement of the dorsal, 12 mm. from the snout and 5 mm. behind the root of the pectorals. The *anal* begins behind the end of the dorsal and has about 7 rays; it is about as high as the dorsal, but its base is rather longer. *Caudal* forked.

There are no spines on the tail above or below. The lateral line could not be made out.

I am much indebted to the Rev. Padre Ernesto Schmitz for the single specimen of this little fish that has occurred. It was obtained from a fisherman. It was only  $1\frac{9}{16}$  inch long, with a height of  $\frac{1}{4}$  inch. When it came into my hands it had been much injured, and it has therefore been impossible to speak positively as to some of the details. Perhaps it had been found in the stomach of another fish. However that may be, it had a deep-sea aspect. The following are the dimensions:—

	millim.
Total length of the fish . . . . .	39
Length to base of the caudal fin . . . . .	34
Height . . . . .	6.5
Head, length 8; thickness . . . . .	4
Eye, longer axis 2.5. Rictus nearly . . . . .	7
Dorsal fin, length of base ca. 5; height in front ca. . .	5
Ventral fins, distance from snout 12; from root of pectorals . . . . .	5
Anal fin, height ca. 5; length of base ca . . . . .	6
Anal fin, distance from end to base of caudal . . . . .	7

#### Family STERNOPTYCHIDÆ.

##### 5. GONOSTOMA MADERENSE, sp. n.

B. 11. P. 10. V. 8. A. 33. C. III. + 19 + III.

Elongate, compressed: the height compared with the length minus the caudal fin being as 1 to  $6\frac{1}{3}$ . Blackish, with two rows of silvery or pale steel-blue spots along each side of the belly. The specimen seems to have been clothed with scales, but they have disappeared except from the head. The ridge of the back is rugosely warted, and apparently there have been no scales in that part.

The *head* is to the length without the caudal as 1 to  $5\frac{1}{5}$ . The top of the head is scaleless, and two low converging ridges meet in front of the orbits. The checks bear rather large scales. The opercular pieces are very thin and the gill-openings very wide. The profile is rather steep and the snout short. The round eye does not reach to the profile; its diameter is contained in the head about five times; it is distant from the snout rather more than one diameter, and from the jaw rather less. The upper border of the *mouth* is formed partly of the premaxillary and partly of the maxillary, both being armed with teeth; the latter is dilated posteriorly. The

riectus is oblique and extends much beyond the eye. The inside of the mouth and the gill-covers is black. There are no pseudo-branchiæ. The under jaw for the greater part of its length fits inside the upper, and it carries a row of sharp, curved, conical teeth, with a few small ones in the intervals between them. In front there is an outer row of eight similar, but shorter teeth. In the upper jaw there is only one row of similarly shaped teeth in front; then come three on each side, the longest in the mouth, and these are about 3 millim. in length. Posteriorly the longer teeth become smaller and the intervening teeth very small. There are a few teeth on the vomer; on the palatines a row of minute sharp teeth; a patch of minute teeth on the entopterygoids; and at the tip of the very small tongue a few minute teeth.

The *dorsal* fin is placed at the middle of the back over the space between the ventral and anal. It has 11 rays and its base is 11 mm. long. It is rather injured, but what remains has a height of 13 mm. There is no adipose fin, nor are there any spines behind the dorsal or anal. The pointed *pectorals* have ten rays, are inserted low down, and do not reach so far back as the root of the ventrals. The narrow pointed abdominal *ventrals* contain 8 rays and reach back beyond the beginning of the anal; they are shorter than the pectorals. The *anal* is not so high as the dorsal, but its base is longer; it has about 33 rays. The deeply cleft *caudal* is damaged, but as it is it measures 14 mm.

The *lateral line* begins near the edge of the opercle one third of the height from the outline of the back, and falls gently until it reaches the middle of the height under the dorsal; it then runs straight to the base of the caudal. The scales having been removed could not be counted.

The two rows of spots previously mentioned are closely set low down on each side of the belly. The upper row, on which between 60 and 70 spots may be counted, begins at the throat and is continued to the base of the caudal; the lower row runs along the isthmus between the gill-openings and likewise extends to the caudal.

A single specimen of this fish was obtained in the fish-market at Funchal and is now in the British Museum. It may be readily distinguished from the known species of this genus by the number of its anal rays.

	millim.
Length of fish without the caudal . . . . .	130
Height at root of pectoral . . . . .	21
Height of tail at base of caudal . . . . .	7
Thickness at the shoulder . . . . .	8 or 9
Head, length 25 mm., thickness . . . . .	8
Eye, diameter . . . . .	5
Dorsal fin, length of base . . . . .	11
Pectorals, length . . . . .	20
Pectorals, distance of root from snout . .	30
Ventrals, length . . . . .	14
Ventrals, distance of root from snout . . .	66
Anal, length of base . . . . .	41